

Perform the operation and simplify.

$$\frac{2}{3} \div \frac{1}{4}$$

$$\frac{2}{3} \cdot \frac{4}{1}$$

$$\frac{(5x^3 - x^2)}{12y^3} \div \frac{(x^2 - 1)}{2y}$$

$$\frac{(5x^3 - x^2) \cdot 2y}{12y^3 (x^2 - 1)}$$

$$\frac{x^2(5x - 1) \cdot \cancel{2y}}{6 \cancel{12} y^{\cancel{3}} (x^2 - 1)}$$

$$\frac{x^2(5x - 1)}{6y^2(x^2 - 1)}$$

$$\frac{x^2}{x^2 + 1}$$

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(13) $\frac{x^2 - 36}{x^2 + 12x + 36} = \frac{\cancel{(x+6)}(x-6)}{\cancel{(x+6)}(x+6)}$

a=x, b=6

$$a^2 - b^2 = (a+b)(a-b)$$

(273) $\frac{x^2 - 2x - 3}{x^2 - x - 6} = \frac{\cancel{(x-3)}(x+1)}{\cancel{(x-3)}(x+2)}$

$$\begin{aligned}
 24) \quad & \frac{\cancel{5}x^3\cancel{y}}{\cancel{x}^2y^2} \cdot \frac{y^3}{3\cancel{5}x^2} = \frac{\cancel{x}\cdot y^3}{3x^2\cancel{y}} \\
 & = \boxed{\frac{y^2}{3x}}
 \end{aligned}$$

25)

$$\frac{48x^5y}{y^4} \cdot \frac{x^2y}{6x^3y^2}$$

$$\frac{48x^5}{y} \cdot \frac{x^2y}{6x^3y^2}$$

$$\frac{48x^5}{y} \cdot \frac{1}{6xy} = \frac{48x^5 \cdot 1}{y \cdot 6xy} =$$

$$8 \frac{48x^5}{6y^2x} = \boxed{\frac{8x^4}{y^2}} = 8x^4y^{-2}$$

$$= \frac{8}{x^{-4}y^2}$$

$$29) \quad \frac{x+5}{4x-16} \cdot \frac{2x^2-32}{x^2-25}$$

$$\frac{x+5}{4(x-4)} \cdot \frac{2(x^2-16)}{(x^2-25)}$$

$a=x \quad b=4$
 $a=x \quad b=5$

a^2-b^2
 $=(a+b)(a-b)$

$$= \frac{\cancel{(x+5)}}{4\cancel{(x-4)}} \cdot \frac{2\cancel{(x+4)}\cancel{(x-4)}}{\cancel{(x+5)}\cancel{(x-5)}}$$

$$= \frac{x+4}{2(x-5)}$$

$$26) \frac{\cancel{x}(x-3)}{(\cancel{x-2})} \cdot \frac{(x+3)\cancel{(x-2)}}{\cancel{x}}$$

$$\frac{(x-3)(x+3)}{1}$$

$$\frac{4}{1} = 4$$

$$34) \frac{5x^2y^3}{x^7} \div \frac{30xy^4}{y^3}$$

$$\frac{5\cancel{x^2}y^3}{\cancel{x^7}} \cdot \frac{\cancel{y^3}}{30x\cancel{y^4}}$$

$$\frac{5\cancel{x}\cancel{y^3}}{\cancel{x^7}30\cancel{x}} \frac{5y^2}{30x^6} = \frac{y^2}{6x^6}$$